selected from the group consisting of nitrocellulose, diazocellulose, glass, polystyrene, polyvinylchloride, polypropylene, polyethylene, polyvinyldifluoride and nylon.

[0014] Further, compositions of the invention may contain any number of molecules. For example, when the invention is a composition comprising a solid support, this solid support may contain from about two to about four thousand molecules (e.g., proteins), from about two to about three thousand molecules, from about two to about two thousand molecules, from about two to about one thousand molecules, from about one hundred to about five thousand molecules, from about one hundred to about four thousand molecules, or from about one hundred to about one thousand molecules.

[0015] The number of pathogenic agents represented in compositions of the invention can vary considerably. For example, when the invention is directed to a solid support that contains proteins, the solid support may contain proteins that share sequence identity with at least one protein from about two to about two hundred, from about two to about four hundred, from about five to about two hundred, from about ten to about two hundred, from about twenty to about two hundred, from about thirty to about two hundred, or from about forty to about two hundred different pathogenic agents. Of course, compositions of the invention could contain other molecules instead of proteins or may contain different types of molecules (e.g., some spots of microarray could contain proteins and other could contain polysaccharides). Specific examples of classes of pathogenic agents are those in the following groups: human immunodeficiency virus, *Mycobacteria, Chlamydia, Shigella, Treponema, Rickettsia*, hemorrhagic fever viruses, and human papilloma viruses.

[0016] *Mycobacterium* species that may be used in the practice of the invention include *Mycobacterium tuberculosis, Mycobacterium szulgai, Mycobacterium smegmatis, Mycobacterium marinum, Mycobacterium bovis, Mycobacterium caprae, Mycobacterium simiae, Mycobacterium terrae, Mycobacterium neoaurum, Mycobacterium simiae, Mycobacterium avium, Mycobacterium parascrofulaceum, Mycobacterium gordonae*, and *Mycobacterium leprae.*

[0017] Other organisms that may be used in the practice include those of the following genera/species: *Bacillus* (e.g., *Bacillus anthracis*), *Candida* (e.g., *Candida albicans, Candida guilliermondii, Candida glabrata, Candida tropicalis*, etc.), *Porphyromonas* (e.g., *Porphyromonas gingivalis*), *Ochrobactrum* (e.g., *Ochrobactrum anthropi*), *Helicobacter* (e.g., *Helicobacter pylori*), *Staphylococcus* (e.g., *Staphylococcus aureus*), and *Mycoplasma* (e.g., *Mycoplasma pneumoniae, Mycoplasma bovis, Mycoplasma bovigenitalium, Mycoplasma gallisepticum, Mycoplasma bovigenitalium, Mycoplasma pulmonis*, etc.).

[0018] Molecules may be linked to solid supports by any number of methods. These linkages may be covalent or non-covalent (e.g., ionic, hydrophobic, hydrophilic, etc.). Further, molecules may be affixed to solid supports in such a way as to form an array. Molecules may be located in discrete locations in a line or in a series of rows and columns. One format for an array is shown in FIG. **1**A and FIG. **1**B.

[0019] The invention also relates to methods for determining immune status of individuals. Immune status may be determined for any number of purposes and may be used, for example, to determine whether individuals have been exposed to one or more pathogenic agent or to determine whether vaccination(s) have resulted in the generation of immunological response(s) (e.g., protective immunological response(s)). In specific embodiments, methods of the invention include those for determining immune status in one or more individual with respect to one or more, two or more, three or more, or four or more (e.g., one to twenty, two to twenty, three to twenty, four to twenty, five to twenty, eight to twenty, twelve to twenty, ten to fifty, fifteen to fifty, twenty to fifty, ten to eighty, etc.) pathogenic agents. With respect to one individual, such methods may comprise: (a) obtaining a sample from the individual; (b) contacting the sample with a solid support as described herein; and (c) identifying locations on the solid support to which antibodies bind, thereby determining immune status. The invention also provides methods for determining whether molecules induce immunological responses.

[0020] The invention also includes method for identifying molecules that induce immunological responses in individuals. In particular aspects, such methods include those for identifying one or more molecule that induces an immunological response in an individual. Exemplary methods comprise: (a) either (i) contacting the individual with a pathogenic agent or one or more biological material from the pathogenic agent or (ii) selecting the individual on the basis of past exposure to the pathogenic agent; (b) obtaining a sample from the individual; (c) contacting the sample with a solid support, wherein the solid support contains molecules as described herein; and (d) identifying the binding of antibodies to locations on the solid support, thereby identifying one or more molecule that induces an immunological response in the individual.

[0021] In many instances, methods discussed herein with include controls. In one aspect, such control may include obtaining a sample from an individual prior to contacting of the individual with molecules of pathogenic agents. This sample may then be screened to identify antibodies present before the individual is contacted with the molecules of the pathogenic agents. These antibodies may then be subtracted from the data set.

[0022] Locations on arrays may contain more than one molecule or one or more mixtures of molecules. For example, a single location (e.g., spot) on an array may contain two different proteins and a carbohydrate from the same pathogen. In many instances, such a location would be designed to bind antibodies induced by the pathogen. One purpose for mixing such molecules is to identify samples that contain antibodies specific for the pathogen, when it is not necessary to know exactly what molecule has induced the immune response in the individual from which the sample has been obtained. Another example is where molecules from different pathogens are located in a single location on an array. In many cases, such a location on an array may be used to determine immunological status or prior contact with one of a number of pathogens such as different types of human immunodeficiency viruses. As an initial screen, it may not be necessary to determine which member(s) of the pathogenic agent class represented in the location the individual has been exposed to. One advantage of using arrays as described above is that they reduce costs and require smaller samples. Thus, the invention includes multi-level screening of samples from individual, wherein at the first level of screening an array as described immediately above is employed, followed by more "specific" arrays are used, as necessary, in the second level. One example of a "specific" array is that shown in FIG. **1**A and